UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,147	06/07/2005	David W F Standingford	540-564	8717

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EXAMINER
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ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/538,147	STANDINGFORD ET AL.
	Examiner	Art Unit	
	ADRIAN L. KENNEDY	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>07 June 2005</u>.
2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-15,17 and 18</u> is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) <u>1-15 and 18</u> is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on <u>07 June 2005</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☒ All b)☐ Some * c)☐ None of:
    1.☒ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>6/7/05</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5)☐ Notice of Informal Patent Application
6)☐ Other: _____.

Examiner's Detailed Office Action

1.   This Office Action is responsive to **Application 10/538,147**, filed **September 30, 2004**.

2.   **Claims 1-15 and 17-18** will be examined.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

4.   Claims 1, 4, 12-15 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Altshuler et al. (USPN 5,719,794, referred to as Altshuler) in view of Hoffman et al.

(Genetic Programming for Model Selection of TSK-Fuzz Systems, referred to as Hoffman),

Whitley (A Genetic Algorithm Tutorial, referred to as Whitley), and Rosca (Toward Automatic

Discovery of Building Blocks in Genetic Programming, referred to as Rosca)

Regarding claim 1:

Altshuler teaches

        (a) parameterising a design space according to a set of parameters (Altshuler: Column(C)

        4, Lines(L) 29-36: Examiner's Note(EN): Having not further defined the applicant's

        claimed "parameterising" in the claimed invention, the examiner has found that the

        claimed "parameterising" reads on the specification of antenna properties and

        computation of the antenna properties as taught by Altshuler.);

(b) creating a parent population of relationships by random selection amongst the set of parameters (Altshuler: C 3, L 65 – C 4, L 3: EN: Having not further defined the applicant's claimed "creating [of] a parent population" in the claimed invention, the examiner has found that the claimed "creating [of] a parent population" reads on the creation of a large population of wire configurations where the wire configuration are randomly selected as taught by Altshuler.);

Altshuler does not teach encoding the parent population, grouping functional elements, creating and offspring population, reporting results, ranking complexity, presenting functional elements, or a signature corresponding to a total.

However, Hoffman does teach

(c) encoding the parent population into a population of functional elements, each functional element comprising terminal nodes and functional nodes (Hoffman: Page(P) 16, ¶ 1: EN: Having not further defined the applicant's claimed "function elements" in the claimed invention, the examiner has found that the claimed "function elements" are inherent in Hoffman teaching the use functional symbols and terminal symbols.);

(d) grouping functional elements into clusters according to the similarity between functional elements (Hoffman: P 19, ¶ 3: EN: Having not further defined the applicant's claimed "grouping [of] functional elements" in the claimed invention, the examiner has found that the claimed "grouping [of] functional elements" reads on the partitioning of nodes as long as a node isn't encountered. It would have been obvious to one of ordinary skill in the art at the time of invention that the partitioned (i.e. grouped) nodes are "similar" in that they are non-unique.);

(e) creating an offspring population of functional elements by performing genetic operations on the parent population (Hoffman: P 17, ¶ 3: EN: Having not further defined the applicant's claimed "genetic operations" in the claimed invention, the examiner has found that the claimed "genetic operations" reads on the crossover operations taught by Hoffman.); and

(f) reporting results by grouping functional elements into clusters according to step (d) above (EN: The examiner takes the position that in teaching the "grouping [of] functional elements" as set forth in '(d)' above, the applicant's claimed "reporting" is inherent in the invention of Hoffman.)

Hoffman does not teach ranking complexity, presenting functional elements, or a signature corresponding to a total.

It would have been obvious to one of ordinary skill in the art to combine the genetic algorithm based design method of Altshuler with the genetic programming method of Hoffman for the purpose of making use of functional and terminal nodes (Hoffman: P 16, ¶ 1).

However, Whitley does teach

ranking the complexity of functional elements according to their signature (Whitley: P 70, Table 1: EN: The examiner takes the position that the applicant's claimed "ranking [based on] complexity" reads on the ranking of strings based on their "complexity", where the "complexity" is inherent in the string. This position is supported by the applicant not claiming what the "complexity" is or is based on, and the examiner asserting that "complexity" is an inherent value in "function elements".) and

presenting a plurality of functional elements from the clusters according to the ranking

(Whitley: P 70, Right Column (RC), ¶ 2: EN: The examiner takes the position that the

applicant's claimed "presenting" reads on the ranking of strings, and the strings inherently

including bits which indicate their corresponding partitions (i.e. clusters).)

Whitley does not teach a signature corresponding to a total.

It would have been obvious to one of ordinary skill in the art to combine the genetic

algorithm based design method of Altshuler with the genetic algorithm tutorial of

Whitley for the purpose of ranking (Whitley: P 70, Table 1).

However, Rosca does teach

a signature that corresponds to the total of terminal nodes and functional nodes (Rosca:

Section(S) 6.1, Table 1; EN: The examiner takes the position that the applicant's claiming

of a signature corresponding to the total of nodes reads on the signature corresponding to

the number of arguments as taught by Rosca.).

It would have been obvious to one of ordinary skill in the art to combine the genetic

algorithm based design method of Altshuler with the genetic programming method of

Rosca for the purpose of using signatures (Rosca: S 6.1, Table 1).

Regarding claim 4:

Altshuler teaches

The method wherein a fitness value of a functional element is determined in accordance

with how favourably the functional element compares to the design space (Altshuler: C 4,

L 37-40: EN: Having not further defined the applicant's claimed "fitness value" in the

claimed invention, the examiner has found that the claimed "fitness value" reads on the

cost function as taught by Altshuler.).

Regarding claim 12:

Altshuler teaches

The method wherein step (e) includes performing elitism genetic operations (Altshuler: C

4, L 20-23: EN: Having not further defined the applicant's claimed "elitism genetic

operations" in the claimed invention, the examiner has found that the claimed "elitism

genetic operations" reads on the survival of the fittest as taught by Altshuler.) by

retaining functional elements with the highest fitness values unchanged.

Regarding claim 13:

Altshuler teaches

The method wherein step (e) includes performing introduction genetic operations by

introducing new randomly-generated functional elements (Altshuler: C 3, L 65 – C 4, L

3: EN: Having not further defined the applicant's claimed "performing [of] introduction

genetic operations" in the claimed invention, the examiner has found that the claimed

"performing [of] introduction genetic operations" reads on the creation of a large

population of wire configurations where the wire configuration are randomly selected as

taught by Altshuler.).

Regarding claim 14:

Altshuler teaches

> A method wherein steps (d) and (e) are repeated to produce successive offspring
> populations, the preceding offspring population acting as the parent population for each
> genetic operation step (EN: The examiner takes the position that the applicant's claimed
> repeating to produce additional offspring would have been obvious to one of ordinary
> skill in the art at the time of invention. This position is supported by it being obvious to
> one of ordinary skill in the art that when creating offspring in populations, the previously
> created offspring become the parents of further generations.).

Regarding claim 15:

Altshuler teaches

> The method wherein steps (d) and (e) are repeated successively until a single fitness
> value or a predetermined plurality of fitness values above a certain threshold level is or
> are achieved (Altshuler: C 4, L 15-25 and L 38-40: EN: The examiner takes the position
> that the applicant's claimed "repeating" until a single or plurality of fitness values are
> produced is obvious in light of Altshuler teaching the generation of a plurality of
> solutions, each of witch have a figure of merit (i.e. fitness value), until an optimal
> solution (which also has a figure of merit) is obtained.).

Regarding claim 17:

Altshuler teaches

A computer for use with the method when programmed to perform steps (a) to (f)

(Altshuler: C 3, L 57-59: EN: The examiner takes the position that the applicant's

claimed use of a computer is inherent in Altshuler teaching that his invention being

computerized.).

Regarding claim 18:

Altshuler teaches

A computer program product comprising program instructions for causing a computer to

operate (Altshuler: C 3, L 57-59: EN: The examiner takes the position that the

applicant's claimed computer program product is inherent in Altshuler teaching that his

invention is used in conjunction with electromagnetic code.).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Koza (USPN 4,935,877) is cited for his genetic algorithms for solving problems.

Examiner's Opinion:

The examiner has considered the applicant's arguments in light of the claimed invention.

Furthermore, the examiner respectfully reminds the applicant that "**during examination,

the claims must be interpreted as broadly as their terms reasonably allow**". (MPEP

2111.01 [R-5] I)

It is the goal of the Examiner to move the applicant's claimed invention towards allowability. However, as presently claimed, the applicant's claimed invention is substantially broad and is broad enough to read on the prior art of record. Specifically, the terms "functional elements", "signature", "similarity", "reporting [of] results", "complexity" (Claim 1) are capable of being interpreted several ways.

Regarding the applicant's claimed "functional elements", it is clear from the applicant's disclosure that they are directed to tree based structures (as disclosed in ¶ 0023), however this limitation is not found in the claimed invention (Specifically claim 1), furthermore it cannot be relied as a limitation in the claimed invention.

Regarding the applicant's claimed "signature", it is not clear whether the claimed "signature" is implicit or explicit in the "functional elements". This is an issue because the examiner takes the position that whether the signature is implicit and/or explicit directly affects the scope of the applicant's claimed "functional elements". Additionally, it is an issue as to whether "function elements" merely have (i.e. "consist of") signatures, or are defined by signatures. As far as the presently claimed invention, the examiner takes the position that "functional elements" as merely "having" signatures.

Regarding the applicant's claimed "similarity", it would be of great assistance to the examiner if the applicant could claim or indicate what the "similarity" is based on. This is an issue because as broad as the term "similarity" is, the examiner could reasonably assert that "functional elements" are similar in that they have no similarities, which would not be outside the scope of the presently claimed invention.

Regarding the applicant's claimed "reporting [of] results", it is not clear whether the

"reporting [of] results" is actually an additional step or if the "reporting [of] results"
automatically takes place once step (d) takes place.

Regarding the applicant's claimed "complexity", it is not clear from claimed invention
whether the "complexity" is implicit or explicit in functional elements, or what the
complexity is based on. Furthermore, the examiner has interpreted the "complexity" to
be implicit in the "functional elements".

Finally, should the applicant choose to amend, the Examiner respectfully suggests that
the applicant consider the teachings of Paragraphs 0007 and 0008 (specifically the
discussion of PAM partitioning), Paragraph 0018 (specifically the discussion of intra-
cluster genetic operations), Paragraph 0056 (specifically the discussion of the distinction
between terminal nodes and functional nodes), and/or the further defining of the above
cited terms in the claimed invention. (This is not to be an all inclusive list of all **possibly**
patentably distinct subject matter, but is meant to only indicate what the examiner found
to be interesting subject matter on a cursory overview of the disclosed invention.)

Claims 1-15 and 17-18 are rejected.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Adrian L. Kennedy whose telephone number is (571) 270-1505. The

examiner can normally be reached on Mon -Fri 8:30am-5pm. If attempts to reach the examiner

by telephone are unsuccessful, the examiner's supervisor, David Vincent can be reached on

(571) 272-3080. The fax phone number for the organization where this application or

proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application

Information Retrieval (PAIR) system. Status information for published applications may be

obtained from either Private PAIR or Public PAIR. Status information for unpublished

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system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ALK   David Vincent
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/Joseph P. Hirl/
Primary Examiner, Art Unit 2129